Extruding and Drawing Machine Setters, Operators, and Tenders

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What They Do

Drawing and extruding are one of many machine processes used to turn raw materials into finished manufactured products. Extruding and drawing forces plastics or metal materials through dies into desired shapes by pushing or pulling. Heat may or may not be used depending upon the material. Extruding and Drawing Machine Setters, Operators, and Tenders (Metal and Plastic) set up, operate, or tend machines to push or pull thermoplastic or metal materials into tubes, rods, hoses, wire, bars, or structural shapes. Examples of extruded metal products include copper plumbing pipe; aluminum tracks, frames, and rails; and steel rods and tracks. Plastic products include PVC pipes, medical grade tubing, and window frames.

Other titles used for Extruding and Drawing Machine Setters, Operators, and Tenders include Extrusion Technician, Machine Operator, Core Extruder, Extruder Operator, Extruding Press Adjuster, Extruding Press Operator.

Tasks

- Determine setup procedures and select machine dies and parts, according to specifications.
- Select nozzles, spacers, and wire guides, according to diameters and lengths of rods.
- Install dies, machine screws, and sizing rings on machines that extrude thermoplastic or metal materials.
- Change dies on extruding machines according to production line changes.
- Adjust controls to draw or press metal into specified shapes and diameters.
- Load machine hoppers with mixed materials, using augers, or stuff rolls of plastic dough into machine cylinders.
- Start machines and set controls to regulate vacuum, air pressure, sizing rings, and temperature, and to synchronize speed of extrusion.
- Measure and examine extruded products in order to locate defects, and to check for conformance to specifications; adjust controls as necessary to alter products.
- Replace worn dies when products vary from specifications.
- Clean work areas.

*Detailed descriptions of this occupation may be found in the Occupational Information Network (O*NET) at online.onetcenter.org.*

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Important Skills, Knowledge, and Abilities

- Operation and Control — Controlling operations of equipment or systems.
- Operation Monitoring — Watching gauges, dials, or other indicators to make sure a machine is working properly.
- Quality Control Analysis — Conducting tests and inspections of products, services, or processes to evaluate quality or performance.
- Production and Processing — Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
- Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
- Control Precision — The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.
- Static Strength — The ability to exert maximum muscle force to lift, push, pull, or carry objects.
- Problem Sensitivity — The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

Work Environment

Extruding and Drawing Machine Setters, Operators, and Tenders work indoors in machine shops and factories with controlled environment for worker comfort and product quality. They must be alert to the hazards of machinery constantly in motion and observe safety rules. They often wear safety glasses and earplugs and other protective equipment. They stand most of the day and must keep pace with the production line.

Some manufacturing plants operate around the clock, and workers may be required to work evening, night, or weekend shifts, as well as overtime when needed. As workers obtain seniority, they have more choice about shift assignments. Union membership may be available in some industries.

California's Job Outlook and Wages

The California Outlook and Wage table below represents the occupation across all industries.

Standard Occupational Classification	Estimated Number of Workers 2004	Estimated Number of Workers 2014	Average Annual Openings	2006 Wage Range (per hour)
Extruding and Drawing Machine Setters, Operators, and Tenders (Metal and Plastic)				
51-4021	5,300	4,700	180	$8.69 to $14.95

Wages do not reflect self-employment.
Average annual openings *include new jobs plus net replacements.*
Source: www.labormarketinfo.edd.ca.gov, Employment Projections by Occupation and OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.

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Trends

The occupation of Extruding and Drawing Machine Setters, Operators, and Tenders will decline slightly when compared to all California occupations. Most job opportunities will occur from replacing people who retire or permanently leave the field for other reasons. Temporary help services will experience the most growth in hiring Extruding and Drawing Machine Setters, Operators, and Tenders as employers continue the lean manufacturing movement.

Training/Requirements/Apprenticeships

Extruding and Drawing Machine Setters, Operators, and Tenders often learn the basic skills from experienced workers on the job. They start as a Tender and then advance to Operator and Setter with experience. Community college or vocational school training programs in plastic engineering technology, precision metal working, machine shop, and machine tool technology are available in many areas of California. Use the *Training Information* feature on the *Career Center* page at www.labormarketinfo.edd.ca.gov to identify training programs available in specific geographic locations.

Recommended High School Course Work

High school students interested in this kind of work should take mathematics including basic statistics as well as any metal shop courses available.

Where Do I Find the Job?

Direct application to employers remains one of the most effective job search methods.

Use the *Search for Employers by Industry* feature on the *Career Center* page at www.labormarketinfo.edd.ca.gov to locate employers in your area. Search using keywords from the following manufacturing industry names to get a list of private firms and their addresses:

- All Other Plastics Product
- Aluminum Foundries (except Die-Casting)
- Current-Carrying Wiring Device
- Dental Laboratories
- Iron and Steel Mills
- Miscellaneous Electrical Equipment
- Nonpackaging Plastics Film and Sheet
- Professional Employer Organizations
- Steel Foundries (except Investment)
- Surgical Appliance and Supplies
- Temporary Help Services
- Urethane and Other Foam Product

Search these **yellow page** headings for listings of private firms:

- Employment-Temporary
- Metal Fabricators
- Metal Stamping
- Plastics-Extruders
- Plastics-Fabricators

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Where Can the Job Lead?

Workers advance from Machine Tender to Operator to Setter. Opportunities for advancement could include supervision, depending on the size of the firm. With further education or training, workers could become Computer Numerical Controlled Machine Operators, Machinists, or Tool and Die Makers.

Other Sources of Information

Aluminum Extruders Council
www.aec.org

National Tooling & Machining Association
www.ntma.org

National Institute for Metalworking Skills
www.nims-skills.org

Precision Metalforming Association Educational Foundation
www.pmaef.org

The Society of the Plastics Industry
www.socplas.org

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